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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/938,777	08/24/2001	Densen Cao	5045 P	2934

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[REDACTED] EXAMINER

CHOI, JACOB Y

[REDACTED] ART UNIT [REDACTED] PAPER NUMBER

2875

DATE MAILED: 05/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/938,777	CAO, DENSEN
	Examiner	Art Unit
	Jacob Y Choi	2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 10 March 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 33-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 40 is/are allowed.
- 6) Claim(s) 33-39 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.

- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
- 1 Certified copies of the priority documents have been received.
- 2 Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Begemann (USPN 6,220,722) in view of Wojnarowski et al. (USPN 6,412,971) and either Madadi et al. (USPN 5,688,042) or Johnson (USPN 5,463,280).

Regarding claim 33, Begemann discloses an enclosure (5), the enclosure being fabricated from a transparent material through which visible light may pass, the enclosure being generally impermeable to gas (air), a base to which the enclosure is mounted, the base including a fitting of appropriate shape for insertion into a light bulb socket (2), an interior volume within the enclosure (figure 1 & 2), a heat sink (3, column 4, lines 55-65) located in the interior volume, the heat sink being capable of drawing heat from a vertical cavity (3) surface emitting laser mounted on the heat sink, a plurality of vertical cavity surface emitting lasers, at least some of the vertical cavity surface emitting diodes being capable of emitting light having a wavelength in the range of about 200 nanometers to about 700 nanometers (inherent that LEDs of Begemann is a

visible light source, which includes violet, indigo, blue green, yellow, orange, & red), at least two of the vertical cavity (figure 1 & 2 of reference character 3) surface emitting diode being mounted on the heat sink (3) without any module physically isolating from each other, an air entrance (7, inlet hole), an air exit (6, outlet hole), and an interior airflow path through the heat sink (figures 1 & 2), the airflow path permitting air to enter the heat sink through the air entrance, absorb heat from the heat sink, and exit the heat sink through the air exit, air located within the enclosure (column 4, lines 5-25), a fan (9) within the enclosure for bringing air into the air entrance and forcing air through the airflow path and through the air exit, an electrical connection between at least two of the vertical cavity surface emitting diodes.

Begemann discloses the claimed invention except for the specific details of an AC/DC converter, and an electrical connection between the AC/DC converter and the vertical cavity surface emitting lasers. Madadi et al. (column 2, lines 30-40) and Johnson (column 7, lines 15-30) teaches that it is known to use AC/DC converter for the LED light source(s). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use modification in Begemann with AC/DC converter, sine it is known in the art that semiconductor devices normally requires DC power in order to operate, therefore, providing AC/DC converter as an additive in the Begemann LED lamp apparatus is obvious.

Begemann disclose the claimed invention except for a thermoelectric cooler located on the heat sink. Wojnarowski et al. teaches that it is know to utilize a thermoelectric cooler (column 3, lines 15-35) for optimum thermal management or the

thermoelectric cooler experiencing a decrease in temperature when exposed to a voltage. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use modification in Begemann, as taught by Wojnarowski et al. in order to reduce heat created by the light source to an optimum level by utilizing thermoelectric cooler. Also, it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Begemann discloses the claimed invention except for VCSEL (vertical cavity surface emitting lasers. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize VCSELs instead of LEDs, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. Also, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize VCSELs instead of LEDs, since the examiner takes Official Notice of the equivalence of VCSEL and LED for their use in the general illumination and the selection of any of these known equivalents would be within the level of ordinary skill in the art.

Note: Haitz (USPN 5,758,951 & 5,707,139) discloses commonly used VCSEL as for general illumination.

3. Claims 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Begemann (USPN 6,220,722) in view of Wojnarowski et al. (USPN 6,412,971) and either Madadi et al. (USPN 5,688,042) or Johnson (USPN 5,463,280) as applied to claim 33 above, and further in view of Larkins (USPN 5,349,599).

Regarding claim 34, Begemann in view of Wojnarowski et al. and either Madadi et al. or Johnson discloses the claimed invention except for the details of epitaxial layers. Larkins teaches that it is known that at least one of the vertical cavity surface emitting lasers includes a substrate on which epitaxial layers are grown (column 10, lines 5-10 & column 13, lines 1-10). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use modification in Begemann, as taught by Larkins to disclose the detailed VCSEL including specific layers, which is known in the art.

Regarding claim 35, Begemann in view of Wojnarowski et al. and either Madadi et al. or Johnson and further in view of Larkin discloses the claimed invention, explained above. In addition, Larkin discloses a buffer layer (column 12, lines 30-35 & column 7 lines 55-65) located on the substrate, the buffer layer serving to mitigate differences in material properties between the substrate and other epitaxial layers.

Regarding claim 36, Begemann in view of Wojnarowski et al. and either Madadi et al. or Johnson and further in view of Larkin discloses the claimed invention, explained above. In addition, Larkin discloses a first cladding layer (column 15, lines 10-35) serving to confine electron movement within the chip, the first cladding layer being adjacent the buffer layer, an active layer, the active layer emitting light when electrons jump to a valance state, a second cladding layer, the second cladding layer positioned so that the active layer lies between cladding layers, a first and a second reflective layer, each of the first and second reflective layers being located on opposite sides of the active layer, each of the first and second reflective layers being located on opposite

side active layer, the reflective layers serving to reflect light emitted by the active layer, and a contact layer on which an electron may be mounted for powering the semiconductor.

Regarding claim 37, Begemann in view of Wojnarowski et al. and either Madadi et al. or Johnson and further in view of Larkin discloses the claimed invention, explained above. In addition, Larkin discloses the substrate is selected from the group consisting of Si, GaAs, GaN, InP, sapphire, SiC, GaSb, InAs.

Regarding claim 38, Begemann in view of Wojnarowski et al. and either Madadi et al. or Johnson and further in view of Larkin discloses the claimed invention, explained above. In addition, Larkin discloses at least one of the epitaxial layers includes a material selected from the group consisting of GaN, AlGaN, AlN, AlGaN, GaInN, and GaInN.

4. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Begemann (USPN 6,220,722) in view of Wojnarowski et al. (USPN 6,412,971) and either Madadi et al. (USPN 5,688,042) or Johnson (USPN 5,463,280) and Larkins (USPN 5,349,599) as applied to claims 33 & 34 above, and further in view of Bill Schweber (LEDs move from indication to illumination).

Regarding claim 39, Begemann in view of Wojnarowski et al. and either Madadi et al. or Johnson and Larkin discloses the claimed invention, except for a luminous power coating on the interior of the enclosure. Schweber teaches that it is known to apply a suitable phosphorus filter / coating in the lens of the LED or the lens fabricated of molded epoxy, which serves to protect the chips and further shape both the LED's

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color spectrum and its luminous spatial distribution. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify a semiconductor light source with a luminous power coating on the interior of the enclosure. Schweber states at page 78 & 80 that such a modifications would be obvious to shape the LED's color spectrum to create a white light.

Note: Reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

Allowable Subject Matter

5. The following is a statement of reasons for the indication of allowable subject matter: the claims recite an air chamber within a heat sink that has an entrance proximate a fitting for installing the device in a socket for receiving electrical power. From that entrance, air would proceed toward the top of the bulb, turn 90 degrees to move laterally a predetermined distance, then turn 90 degrees to move down toward the bottom of the bulb, and out an exit proximate the fitting. Because none of the reference disclose the detailed structure of the air chamber, nor is there any motivation to combine them, the claims are deemed patentable over the prior art of record. Claim 40 is allowed.

Response to Arguments

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6. Applicant's arguments with respect to claims 33-39 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Haitz (USPN 5,758,951) – vertical cavity surface emitting laser arrays for illumination

Haitz (USPN 5,707,139) – vertical cavity surface emitting laser arrays for illumination

Siminovitch et al. (USPN 5,174,646) – heat transfer assembly for a fluorescent lamp and fixture

Patton et al. (USPN 4,674,011) – alignment reference device

Duggal et al. (USPN 6,357,889) – color tunable light source

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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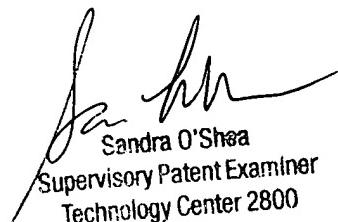
shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Y Choi whose telephone number is (703) 308-4792. The examiner can normally be reached on Monday-Friday (10:00-7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703) 305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-7724.

JC
May 6, 2003



Sandra O'Shea
Supervisory Patent Examiner
Technology Center 2800